

No. 794,003.

PATENTED JULY 4, 1905.

C. E. GATES.
VIBRATOR.

APPLICATION FILED SEPT. 30, 1904.

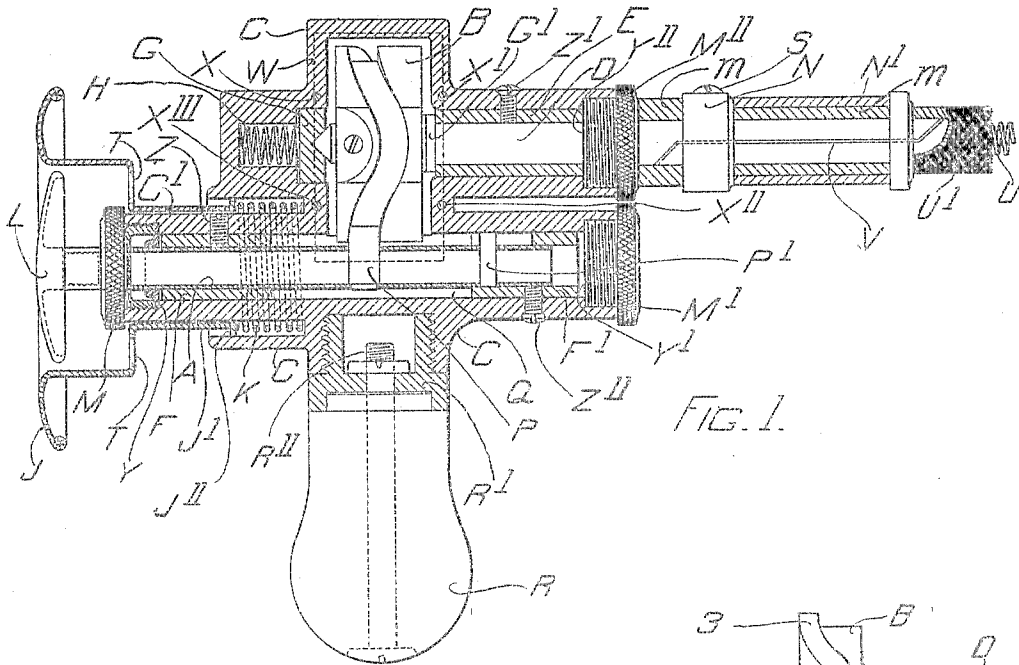


FIG. 1.

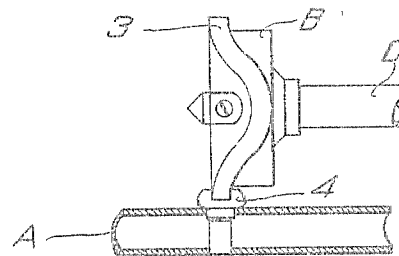


FIG. 2.

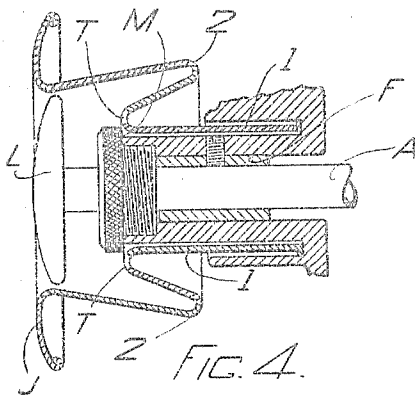


FIG. 4.

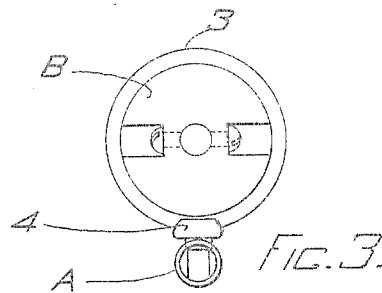


FIG. 3.

WITNESSES
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VIBRATOR.

SPECIFICATION forming part of Letters Patent No. 794,003, dated July 4, 1905.

Application filed September 30, 1904. Serial No. 226,692.

To all whom it may concern:

Be it known that I, CARROLL E. GATES, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Vibrators, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a lengthwise sectional elevation, except for a part of the handle, of one form of apparatus embodying my invention. Fig. 2 is a side view showing a modification of the cam and reciprocating slide construction. Fig. 3 is a front elevation of what is shown in Fig. 2. Fig. 4 shows a modification of the yielding guard. It is bell-shaped and made of yieldable material, such as rubber. Its shank is fixed to the casing.

My invention is a "vibrasage apparatus" (so called) with which light blows of variable intensity and rapid frequency are mechanically produced for use as a therapeutic agent; and the objects of my invention are, first, to provide an automatic governor of the effective intensity of the blows without the necessity of suspending treatment to readjust any part of the mechanism, this governing being effected by means of a yielding guard; second, to produce the recurrence of said blows or vibrations at great frequency; third, to direct said blows or vibrations in a plane corresponding longitudinally with the propelling-shaft instead of at right angles thereto, thus avoiding objectionable crank motions; fourth, to provide means for the suitable lubrication of the rapidly-moving parts without frequent attention to oiling, and, fifth, to maintain a constant and uniform rhythm of the vibrations without influence by or dependency on the intensity of the blow, said yielding guard being the effective means for this purpose.

In the drawings reciprocating slide A carries interchangeable vibratodes, of which vibratode L is an example, and is reciprocated by the rotating cam B by means of the engaging pin P. Said cam B is rotated by an electric or other motor through shaft D and preferably a flexible shaft extension U, which may be affixed to shaft D by the well-known

slip connection V, which is held in place by the connecting-ring N and set-screw S, said ring N having an integral sleeve N', adapted to fit over shank *m*, and said sleeve N' is affixed to the inner casing U' of said flexible shaft U. It will be understood without minute description of methods that said flexible shaft U is firmly attached at its other extremity to the rotative shaft of the motor or other source of power.

Slide A is maintained in place by rings F and F', which form a guideway for the slide and which is slotted for engaging stud P', which is a simple means of preserving the engagement of driving-pin P with cam B, although I wish to have it understood that I do not confine my invention to the specific details of construction shown in my said drawings. Shaft D is provided with a bearing or box E, which, together with guides F and F', may be made of phosphor-bronze or other suitable metal and held in place by set-screws Z Z' Z''.

All of the mechanism heretofore described, except vibratode L, is incased in the oil-tight casing C; but access to the interior of said casing for assembling parts, oiling, and cleaning is provided by a removable plate, the location of which is indicated by dotted lines W, and the method of securing said plate in place is indicated by the location of screws at X, X', X'', and X'''.

The end of shaft D is carried in line by the step G, which is made to compensate for any longitudinal thrust of said shaft or wear between the hub of cam B and collar G' or the said collar and box E by means of the resiliency of spring H, all of which tends to render the operation of the mechanism noiseless. The step G may be made of phosphor-bronze, glass, or other suitable material.

Slide A is preferably made as light in weight as is consistent with necessary strength and stiffness, and to that end I prefer to use a steel tube or light cylinder, which, together with pin P and stud P', should be case-hardened. Said piston passes out of case C through the screw-cap M to attach one of said interchangeable vibratodes. Casing C is further

provided with screw-caps M' and M'', the latter having an integral shank *m*, the use for which has been hereinbefore described. Each of the screw-caps is fitted with a felt washer or other suitable packing, such as Y Y' Y'', to prevent the egress of lubricant. Oil-chamber Q is an ample repository for oil to insure the proper lubrication of the mechanism for an extended period of operation.

I prefer to make handle R of some suitable light material, such as choice wood, and fasten it to threaded ferrule R' by means of bolt R'', and secure said parts to casing C by said threaded ferrule R', as indicated in my drawings, although many other methods of attaching a convenient handle would answer the same purpose, and, in fact, a handle might be dispensed with entirely without impairing the practability or therapeutic importance of my invention.

The compensating or yielding guard J is provided with an integral sleeve J', which is mounted over the cylindrical portion of casing C at C' and is normally impelled forward to the cap M by the resiliency of the spiral spring K, which is housed in casing C and also mounted on said cylindrical portion of casing C in contact with flange J'' at the base of sleeve J'. The operation of said guard J is such that it forms an instantaneous governor of the effective intensity of the blows or vibrations of the vibratode or head L.

As shown, cam B is laid out to cause slide A to make two forward strokes at every revolution of driving-shaft D. Consequently if the driving-shaft makes three thousand revolutions per minute slide A will deliver six thousand forward strokes per minute. This number may be increased or diminished, according to the layout of the cam.

My apparatus may be varied in form without departure from my invention.

It is preferred to mount the shaft and slide so that their lengthwise axes may be in one and the same plane, so as to deliver the blows from the vibratode at an end of the apparatus opposite that end thereof to which the power is applied. If a handle is provided, it is preferably at an angle to the shaft and slide, as shown, and for the same reason. This arrangement greatly facilitates the use of the apparatus. In all other analogous apparatus known to me the vibratodes strike at right angles to the long way of the casing. The guard may be made to yield under the pressure of the operator at his will in various ways other than by backing it with a spring, as shown, and in Fig. 4, showing a modification, the guard is of bell-shaped yielding material, as of rubber or the like, its shank 1 being rigidly

connected to the casing. The fold 2 in this figure shows how the guard may be compressed under pressure of the operator to render the blows of the vibratode harder or lighter on the skin or clothing of the patient against which the outer end of the guard is usually placed. Of course the guard may be dispensed with, if desired.

In Figs. 2 and 3 a slight modification of the cam and slide connection is shown, the cam-wheel B having a raised cam-rib 3, which works in the forked rib-receiving end 4 of the pin P in slide A.

As different sizes of vibratodes will be used, some of which will be larger than that shown and of a diameter approximating the interior diameter of the guard, it is desirable to form air-escape passages or vents T at its inner end in order to prevent compression of air in the guard on the back stroke of the vibratode, and consequently impeding its vibrations.

What I claim is—

1. The combination of a reciprocating vibratode; a yielding guard therefor; and means for reciprocating the vibratode.

2. The combination of a reciprocating slide; a suitable guideway therefor; a cam; a cam connection between the cam and slide; means for rotating the cam and thereby reciprocating the slide; a vibratode mounted on an outer end of the slide; a guard for the vibratode; and a yielding bearing for the guard.

3. The combination of a casing formed with a chamber for a cam and its shaft and bearings and also formed with a chamber for a reciprocating slide and suitable guides therefor; a cam; its shaft and bearings therefor in the first-mentioned chamber; a reciprocating slide and its guides in the second-mentioned chamber; said chambers opening into each other; a cam connection between the cam and slide whereby rotation of the shaft imparts reciprocatory movements to the slide; and packings in said chambers for retaining lubricant therein, the first-mentioned chamber having a recess in which a yielding step for said shaft is mounted.

4. The combination of a reciprocating slide adapted to receive a vibratode at an outer end; a vibratode mounted on said outer end; and an inclosing guard for the vibratode, the guard being outwardly flanged and having air-vents at its inner end.

In testimony whereof I affix my signature in presence of two witnesses.

CARROLL E. GATES.

Witnesses:

EDWARD S. BEACH,
E. A. ALLEN.